

REMARKS

Claims 1-31 remain pending. Claims 1, 11, 12, 21, 22 and 24 are currently amended. The amendments are discussed in the relevant sections below. No new matter has been added. Applicants respectfully request reconsideration and allowance of the present application in view of the following amendments and remarks.

The cover sheet for the Office Action notes that a certified copy of the foreign priority document has not been received. Applicants submit herewith certified copies of United Kingdom priority application GB 9918611.6, filed August 7, 1999, and PCT application PCT/GB00/03035, filed in the UK Patent Office on August 7, 2000. Applicants respectfully request acknowledgment of entry of the certified priority documents.

Claim Objections

Claims 1, 11, and 12 are objected to because of informalities. In claim 1, the word “file” has been amended to “files.” In claim 11, the phrase “said representations a) and b) to determine” has been amended to write out the functions a) and b), as suggested by the Examiner. Similarly, in claim 12, the phrase “function a) and b)” has been amended to write out the functions a) and b).

Rejection of Claim 24 under 35 U.S.C. § 112, Second Paragraph

Claim 24 is rejected under 35 U.S.C. § 112, second paragraph, for alleged indefiniteness. The Examiner states the “claim merely provides an apparatus for performing a method,” and thus “fails to point out the subject matter of the invention” (Office Action, page 1, lines 16-18).

In response to this rejection, Applicants have amended claim 24 to clearly point out the subject matter of the invention. Specifically, claim 24 as amended recites the functional features of the program product, namely how the program interacts with the computer to provide an input (i.e., search criteria comprising a sequence of melodic intervals), then compares the sequence with preselected computer-readable music files to provide a list of possible melodic matches.

Applicants believe that recitation of these functional features in claim 24 satisfies the definiteness requirements of 35 U.S.C. § 112, second paragraph.

Support for these amendments are found in Figure 2, step 20, showing input of search criteria; Figure 2, step 23, showing determination of a sequence of melodic intervals; Figure 2, step 29, showing a comparison of the input with selected portions of a plurality of computer-readable music files; and Figure 2, step 33, showing an output comprising a list of possible matches of the search criteria with at least one of the plurality of computer-readable music files.

In view of the above, Applicants request reconsideration and withdrawal of the rejection of claim 24 under 35 U.S.C. § 112, second paragraph.

Rejection of claims 1-4, 9-25, and 28-31 under 35 U.S.C. §102(b)

Claims 1-4, 9-25, and 28-31 are rejected under 35 U.S.C. §102(b) for alleged anticipation by Ghias et al. (U.S. Patent No. 5,874,686). The Office Action states that the Ghias et al. reference discloses all of the elements of the claimed invention. Applicants respectfully traverse the rejection.

Claim 1 and dependent claims 2-4, 9-20, 28-31, as well as claim 23 and dependent claim 24, all include the limitation of “search criteria comprising a tune as a **sequence of melodic intervals**” (emphasis added). Claim 25 recites “an apparatus for determining a **sequence of melodic intervals**” (emphasis added). Claims 21 and 22 as amended recite “an apparatus for indexing a music database” that includes the step of “applying criteria to identify portions of the files likely to contain tunes wherein said criteria comprise a tune as a **sequence of melodic intervals**” (emphasis added). The instant specification defines “melodic intervals” at page 7, lines 13-14, as “the pitch interval between a note and a preceding note.” The term “interval” is not defined in the specification, but instead has its ordinary meaning, namely “...” Support for the amendment to claims 21 and 22 is found at page 19, lines 17-18, wherein indexing is described as follows: “[t]he third stage is to extract relevant features from the melodies such as melodic intervals.”

Unlike Applicants' invention, the Ghias et al. reference discloses a method of searching music files using *relative pitch transitions between successive notes* (col. 3, lines 8-20). Each note is given a designation as being the same pitch as the previous note (S), a higher pitch than the previous note (U), or a lower pitch than the previous note (D), thereby converting the melody of the song into a sequence of letters using S, U, and D. Inputs are converted into this sequence of pitch changes, and the songs stored in the database are preprocessed and converted into the same format (column 5, line 66).

For a determination of anticipation to be proper, the prior art reference must disclose each and every limitation of the claim. *Atlas Powder Company et al. v. IRECO, Incorporated et al.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999).

The Ghias et al. reference neither teaches nor suggests an “apparatus for searching a database of music files, comprising input means to provide search criteria comprising a tune as a **sequence of melodic intervals**” (emphasis added), as required by claim 1 and dependent claims 2-4, 9-20, 28-31. Nor does the Ghias et al. reference teach or suggest an “apparatus for indexing a music database comprising means for identifying relevant selected portions of a plurality of computer-readable music files by applying criteria to identify portion of the files likely to contain tunes, wherein said criteria comprises a tunes as a **sequence of melodic intervals**” (emphasis added), as required by amended claims 21 and 22. Nor is there any teaching or suggestion in the Ghias et al. reference of (1) a “method for effecting a search through a database of music files comprising: providing as input, search criteria comprising a tune as a **sequence of melodic intervals**” (emphasis added), as required by claim 23; (2) “computer program product, comprising a computer readable medium having thereon computer program code means adapted, such that when said program is loaded onto a computer, said program interacts with said computer: providing as input, search criteria comprising a tune as a **sequence of melodic intervals**” (emphasis added), as required by claim 24; and (3) an “apparatus for determining a **sequence of melodic intervals** from an input source” (emphasis added), as required by claim 25.

Rather than teaching a search or indexing criteria based on a sequence of melodic intervals, the Ghias et al. apparatus performs the searching and comparison functions based on

relative pitch differences between successive notes. Thus, not only are the input and comparison means different, but so too is the end result or output, since the lists generated based on relative pitch differences between notes will be different from the list of potential matches based on melodic intervals, as required by Applicants' claims.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. §102(b) in view of Ghias et al. (U.S. Patent No. 5,874,686) of claims 1-4, 9-25 and 28-31.

Rejection of claims 5-7, 8, 26, and 27 under 35 U.S.C. 103(a)

Claims 5-7 are rejected under 35 U.S.C. 103(a) for allegedly being unpatentable over Ghias et al. in view of Zimmerman (U.S. Patent No. 5,563,358). Claim 8 is rejected under 35 U.S.C. 103(a) for allegedly being unpatentable over Ghias et al. in view of Lybrook et al. (U.S. Patent No. 4,731,847). Claims 26 and 27 are rejected under 35 U.S.C. 103(a) for allegedly being unpatentable over Ghias et al. Applicants respectfully traverse this rejection.

In the Examiner's rejection of claims 1-4, 9-25 and 28-31 under 35 U.S.C. 102(b) in view of Ghias et al., the Examiner asserts that the *Ghias et al. reference discloses all of the elements of each of these claims*. The Examiner states that "Zimmerman et al. disclose teaching or training means, wherein said input means further includes quantization means to determine a closest chromatic interval, a closest whole tone interval, or a closest minor or major third interval between two successive musical pitches . . . it would have been obvious to one of ordinary skill in the art . . . to utilize the teachings of Zimmerman with the apparatus of Ghias et al. because Zimmerman et al. provide the teachings of using a chromatic interval as part of comparing and pitch matching techniques which provides more information for providing a match in melodies or tunes."

As discussed above, the primary reference, Ghias et al. neither teaches nor suggests an apparatus for searching or indexing a music database, or determining a sequence of melodic intervals from an input source, as required by Applicants' claims. Thus, contrary to the Examiner's assertion, the Ghias et al. reference does not "disclose all of the elements of each of

these claims.” As discussed in detail below, none of the secondary references supply the deficiencies.

Zimmerman is directed to using a chromatic interval for comparing and matching pitch as part of the musical instruction of a student. The chromatic interval being calculated is relative to the pitch of the tonic, the first note of the scale (Col. 9, Line 13). Zimmerman et al. does not teach or suggest “an apparatus for searching a database of music files, comprising input means to provide search criteria comprising a tune as a sequence of melodic intervals,” as required by claims 5-7 of the instant application.

The Examiner states that “Lybrook et al. disclose an apparatus, including means...to provide as input additional search criteria comprising text information...it would have been obvious to one of ordinary skill in the art ...to utilize the teachings [of] Lybrook et al. with the teachings of Ghias et al., because the teachings allow for an alternative input, wherein text can be used as an input to the system.” Unlike the present invention, the Lybrook reference discloses a synthesizer to simulate a song based on the input of the user. The allophone rules 103 in Fig. 1 are used in combination with the text input of text material 101 to generate a sequence of allophones (Col. 3, Line 41) to generate sound. Lybrook et al. does not teach or suggest “an apparatus for searching a database of music files, comprising input means to provide search criteria comprising a tune as a sequence of melodic intervals,” as required by claim 8 of the instant application.

Finally, the Examiner states that “Ghias et al. do not disclose means for designating the gradient of each element as one of the categories selected from the group consisting of: horizontal; diagonal; and vertical I non-vertical; and means for coalescing adjacent elements of the same category to form compound elements. However, Official Notice is taken with respect to it being well known in the art to use the gradient and related components for determining points or comparison of an input signal over a period of time.”

For the reasons described below, Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness under the requirements of 35 U.S.C. § 103(a). To establish a *prima facie* case of obviousness, three basic criteria must be met. First,

there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings (*In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). Second, there must be a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure. Finally, the prior art reference (or references when combined) must teach or suggest ***all the claim limitations***. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

Applicants submit that even if the Ghias et al. reference is combined with the Zimmerman et al. reference, the two disclosures do not provide the invention as claimed in claims 5-7. That is, the recited combination lacks essential elements of the claimed invention.

The recited combination of references does not disclose "an apparatus for searching a database of music files, comprising input means to provide search criteria comprising a tune as a sequence of melodic intervals," nor does it disclose "an apparatus for searching a database of music files, comprising input means to provide search criteria comprising a tune as a sequence of melodic intervals."

Applicants also submit that even if the Ghias et al. reference is combined with the Lybrook et al. reference, the two disclosures do not provide the invention as claimed in claim 8. That is, the recited combination lacks essential elements of the claimed invention.

Applicants also submit that even if the Ghias et al. reference is combined with what is known in the art regarding the use of gradient and related components for determining points or comparison of an input signal over a period of time, the recited combination does not disclose, "an apparatus for determining a sequence of melodic intervals from an input source."

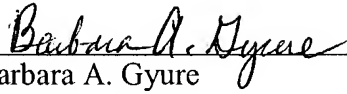
In view of all of the above, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103 (a) rejection of claims 5-8, 26 and 27.

CONCLUSION

Applicants submit that all claims are allowable as written and respectfully request early favorable action by the Examiner. If the Examiner believes that a telephone conversation with Applicants' attorney would expedite prosecution of this application, the Examiner is cordially invited to call the undersigned attorney of record.

Respectfully submitted,

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